

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appl. No. : 10/599,399  
Applicants : Sarah Michelle Lipman, et al.  
Filed : March 16, 2007  
Title : CONTROL APPARATUS  
Art Unit : 2629  
Examiner : Antonio J. Xavier  
Docket No. : POW2B-83992  
Customer No. : 24201

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION OF SARAH M. LIPMAN UNDER 37 C.F.R. § 1.132**

Dear Sir:

I, Sarah M. Lipman, hereby declare as follows:

1. I am one of the named inventors of the above-identified patent application.

I submit this declaration in support of the applicant's response to the non-final Office action mailed July 13, 2010, to overcome the examiner's rejections.

2. I am an expert in electronic input technology, and have spent 8 years working in the field of touchscreen technologies in my role at assignee Power2B Inc., both in an R&D function and in sales and project management functions, planning joint engineering projects with global consumer electronics manufacturers, notably, with the intention of manufacturing consumer electronics devices in accordance with the patent application and pending claims under discussion herein.

3. In preparation for making this declaration, I reviewed the above-identified patent application, the pending claims, the Office action mailed July 13, 2010, and the



examiner cited prior art (i.e., U.S. Patent No. 4,320,292 (Oikawa); PCT Patent Publication No. WO 03/104965 (Lipman)).

4. This declaration is intended to demonstrate to the examiner that with respect to the amendments to claims 1 and 30 from the previous response (namely, “a panel without an optical guide and scattering particles therein defining at least one edge”), applicants’ amended claims contain subject matter that was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention (i.e., the “written description” requirement for a patent application). Further, this declaration as explained below establishes that the claims as amended contains subject matter that was described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it most nearly connected, to make and/or use the invention (i.e., the “enablement” requirement for a patent application).

5. The “panel” defined in claims 1 and 30 is a standard, off-the-shelf panel which scatters light on its own, without need for scattering particles or optical guide channels as in the examiner cited art (Oikawa). The off-the-shelf material inherently has such light-reflecting or -refracting optical qualities.

6. One example is a plain Perspex panel used as the input layer, which material was identified in applicants’ specification. Perspex, which was known in the art at the time of the filing of the priority application, is a transparent acrylic polymer and is also known as plexiglass. At about the filing of the priority application, non-touch sensing mobile phones known in the art typically provide a protective layer positioned just over the LCD display, which is made of Perspex or another similar plastic material, such as a transparent polycarbonate or polycarbonate blend, and can demonstrate the claimed invention with sensors looking into the thin protective layer (< 3 mm thick).

7. Another example is a glass panel used as the input layer. Mobile phones may use a protective layer made of glass, such as Dow Corning’s “Gorilla Glass”



(engineered aluminosilicate glass), instead of plastic. Such protective layers can also demonstrate the claimed invention, as previously described.

8. To the best of my knowledge as a person skilled in the art, neither glass nor plastic protective panels of typical mobile phones is treated in any way that would provide any preferential scattering of light within the panel material to the edges of the layer beyond that inherent to the material properties of the panel. Some protective layers have an anti-glare coating at their surface, which, to the best of my knowledge, does not affect the scattering of light within the protective panel to the edges of the panel, beyond that inherent to the material properties of the panel (whether glass or plastic) .

9. Alternatively, the claimed invention can be demonstrated with sensors looking into the very thin ( $< 2$  mm) top layer of a standard mobile phone LCD, such as a standard Nokia phone's 2.5" LCD (many manufactured by Samsung or Sharp). These standard LCDs are constructed from several layers, the topmost of which is typically made of glass. The claimed invention can be demonstrated therewith with no modification to the display components, except peeling the outer frame edge away from the LCD module to provide viewing access for the sensors. The *underside* of the top glass layer of the LCD panel is usually treated in manufacture by applying a coating of polyimide and rubbing it with cloth to guide alignment of the liquid crystal underneath it during use. To the best of my knowledge as a person skilled in the art, the rubbing of the undersurface of the glass does not provide any preferential scattering of light within the glass to the edges of the glass panel beyond that inherent to the material properties of the glass. In fact, the goal of the LCD module and its components is to facilitate vertical passage of light into and out of the display. Notably, the light scattered within the top glass layer of the LCD and sensed by the sensors of the claimed invention is scattering *before* it reaches the underside of the top glass layer, and, to the best of my knowledge, is not affected by the polyimide or liquid crystal in any way.

10. Also, the claimed invention can be demonstrated with sensors looking into the very thin layers of a resistive touch screen affixed to the top surface of an LCD

module. Such resistive touch screens were commonly used in a Palm PDA or Nokia N900. A resistive touch screen panel is composed of several layers, the uppermost of which are two thin, metallic, electrically conductive layers separated by a narrow air gap. The claimed invention can be demonstrated with sensors looking into upper layers of a standard resistive touch screen, such as those manufactured by Elo or 3M (1-2 mm thick).

11. The examiner's Office action on page 3, para. 3, raises the following questions:

“Claims 1 and 30 recite a panel without an optical guide and scattering particles including at least one detector arranged along said at least one edge and said panel being operative to transmit electromagnetic radiation to said at least one edge, (emphasis added). However, the specification contains no teachings or suggestions directed towards the claimed panel sufficient to reasonably convey to one of ordinary skill in the art that the inventor had possession of the claimed invention at the time the application as filed. Specifically, how does a panel without an optical guide or scattering particles direct a beam of electromagnetic radiation to a detector arranged along one edge of the panel?

Examiner notes paragraph [0050] of the specification as filed teaches the electromagnetic radiation is ‘scattered by the screen.’ Paragraph [0052] teaches the ‘screen preferably is made of a relatively transparent material with small but significant scattering properties’ (emphasis added). How do the aforementioned screens perform light scatter? Does Applicant consider the subject matter to be well known in the art such that further details were omitted?”

12. ***Scattering light without need for the addition of an optical guide and/or scattering particles:*** Every physical material slows the propagation of light within it to a greater or lesser degree, as compared with light propagating in a vacuum (the baseline standard). The extent of such slowing is expressed as the material's refractive index. While the degree of permittivity of the medium primarily affects the speed of the light within it by slowing it down, a secondary effect is to cause a portion of the light to scatter within the medium. In addition, materials such as glass and plastic virtually always



exhibit some degree of non-uniformity, such as fluctuations in density, bubbles, particles, contaminants, and other defects. These “imperfections” have the effect of further scattering propagating radiation. Panels made from glass scatter a very small but nonetheless measurable percentage of electromagnetic radiation that enters them (our estimates range from 1% - 5%, depending in part upon the angle of entrance of the light) without need for introducing additional scattering particles. Panels made from polymers such as Perspex also have inclusions and internal defects that scatter a small portion of incoming light, also without need to introduce an optical guide and/or scattering particles.

13. A person skilled in the art would appreciate and understand this from reading paragraphs [0050] and [0052] of the specification. As stated in paragraph 6 above, the technology of a display panel without an optical guide and/or scattering particles was known at the time the application was filed. Therefore, the written description requirement has been met.

14. The examiner in the Office action on page 3, para. 3, further observes:

“Examiner notes an alternative embodiment is also disclosed. Paragraph [0096] teaches ‘a transparent non-scattering element in contact with a Lambertian surface may be employed.’ However, the claim does not appear to read on this subject matter because ‘said panel being operative to transmit electromagnetic radiation from said at least one beam impinging thereon to said at least one edge thereof’ claims the panel itself is redirecting the beam to the detector.”

15. Claims 1 and 30 do indeed read on this alternative embodiment because “the panel” may be a laminate wherein one layer is a transparent non-scattering element in contact with a Lambertian surface.

16. The examiner’s Office action on page 5, para. 4, raises the following questions:

“With respect to Claims 1 and 30, Applicant’s most recent amendment and arguments, dated June 15, 2010 (hereinafter referred to as ‘Remarks’), attempt to distinguish the structure of the claimed invention from the structure of a

previously cited reference. Specifically, on p. 11 of the Remarks, Applicant argues '[t]he present invention panel does not require specialized optical guide channels and/or scattering particles. To better define the present invention over the art, applicants have amended claim 1...a transparent non-scattering element may be used in an alternative embodiment' (emphasis added). Examiner notes the manner in which the panel is able to transmit the input beam towards detectors arranged along the edges of said panel without optical guides and scattering particles, is not enabled by the specification as filed or reflected in the newly amended claims. Specifically, how does a panel without an optical guide or scattering particles direct a beam of electromagnetic radiation to a detector arranged along one edge of the panel?

Examiner notes paragraph [0050] of the specification as filed teaches the electromagnetic radiation is 'scattered by the screen.' Paragraph [0052] teaches the 'screen preferably is made of a relatively transparent material with small but significant scattering properties' (emphasis added). How do the aforementioned screens perform light scatter? Does Applicant consider the subject matter to be well known in the art such that further details were omitted?

Examiner notes an alternative embodiment is also disclosed. Paragraph [0096] teaches 'a transparent non-scattering element in contact with a Lambertian surface may be employed.' However, the claim does not appear to read on this subject matter because 'said panel being operative to transmit electromagnetic radiation from said at least one beam impinging thereon to said at least one edge thereof' claims the panel itself is redirecting the beam to the detector."

17. As explained above, the display panel of amended claims 1 and 30 in one embodiment can be a display made from commonly found Perspex or acrylic material, which material does not need an additional optical guide and/or scattering particles to reflect or scatter incoming light to at least one edge of the display panel. A person skilled in the art would understand that a commonly found display panel material such as Perspex can be used. Thus, the claims as amended contain subject matter that was

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it most nearly connected, to make and/or use the invention.

18. Although the scattering properties of simple glass or plastic/acrylic sheets used for a display panel were already well-known in the art at the time the priority application was filed, these properties were also well-forgotten in the art. Because the quantity/percentage of light that is scattered is so small compared with the amount that passes through the material (or even that which reflects out of it), most people skilled in the art did not even take it into account in the first place. Engineers tended to focus their efforts on improving Signal-to-Noise Ratio (SNR) of the light signal passing through the display panel, not light scattered to the edges (considered "lost" light). If they wanted to use the scattered light, engineers would add optical guides (as in Oikawa) to preserve the high SNR. Therefore, detecting scattered light from an edge of the display panel without adding an optical guide or scattering particles was proceeding against conventional or accepted wisdom at the time.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature: 

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